

## RAPTOR CONSERVATION IN VERACRUZ, MEXICO

JUAN ESTEBAN MARTÍNEZ-GÓMEZ

*Av. 16 de Septiembre 1758, Veracruz, Veracruz, 91700 México*

**ABSTRACT.**—This article presents aspects of raptor conservation, including training of local students, developing networks to monitor bird trade and to protect natural areas, establishing banding stations in Veracruz, ecotourism, and cooperative efforts among raptor biologists in North America and Veracruz. Because 67 raptor species are found in Veracruz, Mexico, and because the most northern high evergreen rainforest of the continent is located in this Mexican State, a major conservation effort in this region is certainly warranted.

---

### Conservación de aves rapaces en Veracruz, México

**EXTRACTO.**—Este artículo discute aspectos relacionados con la conservación de aves de presa; tales como el entrenamiento de estudiantes locales, el desarrollo de redes de vigilancia para el mercadeo de aves y la protección de áreas naturales, el establecimiento de estaciones de anillamiento, ecoturismo, así como la cooperación entre estudiosos de las aves de presa en Norteamérica y Veracruz. La necesidad de mayores esfuerzos conservacionistas en esta región se hace patente, si se considera que en este estado mexicano se encuentra la selva alta perennifolia más norteña del continente y tiene registradas sesenta y siete especies de aves de presa.

*On 23 April 1990 I became a Hamerstrom "gaboon." During my four-month stay in Plainfield, Wisconsin I learned much about raptors from Frederick and Frances Hamerstrom. I especially enjoyed those times when we talked about their experiences with neotropical raptors in Los Tuxtlas, Veracruz, Mexico, and their interest in tropical forest conservation. The Hamerstroms believe that it is very important to support Latin American students in order to establish a group of individuals with an adequate level of expertise to develop effective conservation schemes in the Neotropics. Here, I return the favor of their training by writing about areas in the Neotropical forest of Veracruz, Mexico, where the Hamerstroms worked in the late sixties.*

### STUDY AREA

The State of Veracruz, Mexico, extends from 17°10'N to 22°15'N, between the Gulf of Mexico to the East and the Mexican states of the Central Plateau to the West (Soto and García 1986). Elevation in the state ranges from sea level to 4300 m above sea level (Marchal 1984). Twenty vegetative types, including high evergreen rainforest, tropical deciduous forest, cloud forest, evergreen oak forest, marshes, mangrove swamps, brackish estuaries, beach communities and various forms of agricultural and grazing lands occur in the region. Eighty-five of 8000 plant species in the region are listed as endangered species (Dirzo 1987, Flores and Gerez 1988). Of the approximately 685 bird species recorded for the state (Loetscher 1941, 1955, Peterson and Chalif 1989, Schaldach pers. comm.), 137 are listed as endangered (Aguilar-Ortiz 1970, Ramos 1985, Vega 1988).

### HISTORICAL VIEW

The role of raptors was notable in the pre-hispanic cultures that flourished in Veracruz. The Olmecas and Totonacas erected sculptures representing several species of birds of prey (De la Fuente 1975, Medellín 1983). The agricultural and silvicultural practices of the ancient residents of Veracruz apparently were compatible with their environment (Siemens 1981, 1982, Alcorn 1983).

An epidemic in the mid-15th century caused a decrease in the Indian population, thus permitting the Spaniards to take over Indian lands, at which time cattle ranching was promoted. Some Indians moved to the mountains, while others were assimilated. This situation, together with a massive immigration from Spain, imposed an incompatible resource management system that had been developed in the temperate regions of the Old World (Gunder 1982, Gómez-Pompa 1985).

As a result, the traditional knowledge of resource management in the area has been forgotten or lost. Consequently, for example, courses offered by the Universidad Veracruzana, colleges of Biology, Veterinary Science and Agronomy, today focus mainly on studies of exotic, rather than native, species, and cattle ranching is currently the predominant agricultural activity in Veracruz.

## CURRENT PROBLEMS

Forest destruction promoted by agriculture and human colonization of tropical areas is the major threat to Neotropical raptors in Veracruz. Forest-dwelling birds have been greatly affected and their population sizes have decreased (Ramos 1985) by this factor. The extirpations of Harpy Eagles from Central Veracruz and Los Tuxtlas, King Vultures and Bicolored Hawks from Los Tuxtlas (Coates-Estrada and Estrada 1985, Iñigo et al. 1987, Aguilar in press a), as well as the proliferation in those areas of raptor species that favor disturbed habitats (Gómez 1991), constitute an example of habitat loss and alteration that applies also to other tropical areas in Mexico.

Raptors are often shot by farmers and hunters even when it is not permitted by law. Most of the hunters in Veracruz are not able to identify native species or to recognize scientific names in hunting calendars so that hunting regulations are rarely followed. Raptors are especially vulnerable to hunting during fall migration, when hunters seeking White-winged Doves (*Zenaida asiatica*) kill large numbers of birds of prey at El Viejón, Veracruz (R.S. Aguilar pers. comm.).

Pesticide pollution constitutes another threat. Albert et al. (1989) found organochlorine compounds in brain, liver and adipose tissue samples of an Ornate Hawk-Eagle from Santa Marta, in Los Tuxtlas, Veracruz. Additional research is needed to determine the impact of pesticides in raptor populations in this region.

Aguilar (in press b) found that in Xalapa, Veracruz, the Roadside Hawk, White-tailed Kite, Crested Caracara and the American Kestrel are frequently traded in local markets; during fall migration other species are trapped and sold in Mexico City (R.S. Aguilar pers. comm.).

## COOPERATIVE RESEARCH AND MANAGEMENT SCHEMES

Despite these problems Veracruz, Mexico, has 67 species of raptors (Table 1), and recent changes in the roles of local universities, together with a growing concern among the civilian population, offer hope.

Several institutions, including the Universidad Veracruzana (U.V.), the Universidad Nacional Autónoma de México (U.N.A.M.), the Instituto de Ecología A.C., the Instituto Veracruzano de Cultura (IVEC), and an emerging local ornithological so-

ciety, could play a major role in raptor conservation (Appendix 1).

Consider, for example, the Universidad Veracruzana. Every university in Mexico has a required undergraduate program called Servicio Social (Social Service), consisting of community service for one year. Much research, both basic and applied, could be accomplished by using this program to foster conservation efforts. Although students must work in a Mexican institution, researchers in North America can direct students and contribute to the establishment of successful conservation programs in Veracruz.

The Instituto Veracruzano de Cultura works mainly to maintain cultural traditions within the State of Veracruz. Several of its programs are concerned with the restoration of traditional methods of natural resource management. It is now realized that the conservation of natural diversity and social diversity go together. This institution has 57 Casas de Cultura (Culture Houses) throughout the State that offer logistic support for students working on their "Social Service."

Training of local people is important because the success of tropical forest conservation depends on local enthusiasm and participation. A major problem in this area is language. Few students in Veracruz speak English, and few American raptor biologists speak Spanish. One solution to this conundrum would be to have Latin American students spend several months interning in North America to allow them to learn English and to prepare them for future interactions with their northern colleagues. They would also then be available to teach Spanish to the North American counterparts.

Other, more advanced, students could begin graduate studies in North America if financial support were available. Upon their return to Latin America they would form the nucleus of a local raptor group.

Raptor biologists visiting Latin America should offer to give talks or workshops to interested local inhabitants. Also, when North American scientists plan research projects in Latin America, they should hire local field assistants. Furthermore, many Mexican universities allow foreign advisers, enabling North American scientists to direct graduate students in Mexico.

Although protected areas in Veracruz cover 1% of the state (Flores and Gerez 1988), only at the Estación de Biología Tropical de Los Tuxtlas (U.N.A.M.) is there appreciable vigilance. For ex-

Table 1. Raptor species reported for Veracruz, Mexico.<sup>1</sup>

ENGLISH NAME	SPANISH NAME <sup>2</sup>	SCIENTIFIC NAME
Black Vulture b <sup>3</sup>	Carroñero común	<i>Coragyps atratus</i>
Turkey Vulture b	Aura común	<i>Cathartes aura</i>
Lesser Yellow Vulture	Aura sabanera	<i>Cathartes burrovianus</i>
King Vulture	Carroñero rey	<i>Sarcoramphus papa</i>
Osprey m	Aguila pescadora	<i>Pandion haliaetus</i>
Gray-headed Kite	Milano cabecigrís	<i>Leptodon cayanensis</i>
Hook-billed Kite	Milano piquiganchudo	<i>Chondrohierax uncinatus</i>
Swallow-tailed Kite m	Milano tijereta	<i>Elanoides forficatus</i>
White-tailed Kite	Milano coliblanco	<i>Elanus caeruleus</i>
Snail Kite	Milano caracolero	<i>Rostrhamus sociabilis</i>
Double-toothed Kite	Milano bidentado	<i>Harpagus bidentatus</i>
Mississippi Kite m	Milano migratorio	<i>Ictinia mississippiensis</i>
Plumbeous Kite	Milano plumizo	<i>Ictinia plumbea</i>
Bald Eagle r	Águila cabeciblanca	<i>Haliaeetus leucocephalus</i>
Northern Harrier m	Aguililla rastrera	<i>Circus cyaneus</i>
Sharp-shinned Hawk m	Gavilán pechirrufo menor	<i>Accipiter striatus</i>
Bicolored Hawk	Gavilán pechigris	<i>Accipiter bicolor</i>
Cooper's Hawk m	Gavilán pechirrufo mayor	<i>Accipiter cooperii</i>
Crane Hawk	Aguililla zancona	<i>Geranospiza caerulescens</i>
White Hawk	Aguililla blanca	<i>Leucopternis albicollis</i>
Common Black Hawk	Aguililla negra menor	<i>Buteogallus anthracinus</i>
Great Black Hawk	Aguililla negra mayor	<i>Buteogallus urubitinga</i>
Harris' Hawk	Aguililla rojinegra	<i>Parabuteo unicinctus</i>
Black-collared Hawk	Aguililla canela	<i>Busarellus nigricollis</i>
Solitary Eagle	Águila solitaria	<i>Harpyhaliaetus solitarius</i>
Gray Hawk	Aguililla gris	<i>Buteo nitidus</i>
Roadside Hawk	Aguililla caminera	<i>Buteo magnirostris</i>
Red-shouldered Hawk b	Aguililla pechirrojoza	<i>Buteo lineatus</i>
Broad-winged Hawk m	Aguililla migratoria menor	<i>Buteo platypterus</i>
Short-tailed Hawk	Aguililla braquiura	<i>Buteo brachyurus</i>
Swainson's Hawk m	Aguililla migratoria mayor	<i>Buteo swainsoni</i>
White-tailed Hawk	Aguililla coliblanca	<i>Buteo albicaudatus</i>
Zone-tailed Hawk	Aguililla aura	<i>Buteo albonotatus</i>
Red-tailed Hawk	Aguililla colirrufa	<i>Buteo jamaicensis</i>
Harpy Eagle	Aguililla Harpía	<i>Harpia harpyja</i>
Black-and-White Hawk-Eagle	Aguililla vientriblanca	<i>Spizastur melanoleucus</i>
Black Hawk-Eagle	Águila tirana	<i>Spizaetus tyrannus</i>
Ornate Hawk-Eagle	Águila elegante	<i>Spizaetus ornatus</i>
Red-throated Caracara u	Caracara comecaao	<i>Daptrius americanus</i>
Crested Caracara	Caracara común	<i>Polyborus plancus</i>
Laughing Falcon	Halcón guaco	<i>Herpetotheres cachinnans</i>
Barred Forest-Falcon	Halcón selvático menor	<i>Micrastur ruficollis</i>
Collared Forest-Falcon	Halcón selvático mayor	<i>Micrastur semitorquatus</i>
American Kestrel b	Halcón cernícalo	<i>Falco sparverius</i>
Merlin m	Halcón esmerejón	<i>Falco columbarius</i>
Aplomado Falcon	Halcón fajado	<i>Falco femoralis</i>
Bat Falcon	Halcón enano	<i>Falco rufigularis</i>
Orange-breasted Falcon	Halcón pechicanelo selvático	<i>Falco deiroleucus</i>
Peregrine Falcon m	Halcón peregrino	<i>Falco peregrinus</i>
Prairie Falcon m	Halcón pálido	<i>Falco mexicanus</i>
Barn Owl	Lechuza de campanario	<i>Tyto alba</i>

Table 1. Continued.

ENGLISH NAME	SPANISH NAME <sup>2</sup>	SCIENTIFIC NAME
Flammulated Owl	Tecolote ojoscuro serrano	<i>Otus flammeolus</i>
Whiskered Screech-Owl	Tecolote rítmico	<i>Otus trichopsis</i>
Vermiculated Screech-Owl	Tecolote crescendo	<i>Otus guatemalae</i>
Crested Owl	Búho corniblanco	<i>Lophotrix cristata</i>
Spectacled Owl	Búho gorjiblanco	<i>Pulsatrix perspicillata</i>
Great Horned Owl	Búho cornado americano	<i>Bubo virginianus</i>
Least Pygmy-Owl	Tecolotito menor	<i>Glaucidium minutissimum</i>
Ferruginous Pygmy-Owl	Tecolotito bajoño	<i>Glaucidium brasilianum</i>
Burrowing Owl	Tecolote zancón	<i>Athene cunicularia</i>
Mottled Owl	Búho tropical	<i>Ciccaba virgata</i>
Black-and-White Owl	Búho blanquinegro	<i>Ciccaba nigrolineata</i>
Barred Owl	Búho serrano ventriblanco	<i>Strix varia</i>
Stygian Owl	Búho cornado oscuro	<i>Asio stygius</i>
Striped Owl	Búho cornado cariblanco	<i>Asio clamator</i>
Short-eared Owl m	Búho cornicorto llanero	<i>Asio flammeus</i>
Northern Saw-Whet Owl	Tecolote abetero norteño	<i>Aegolius acadicus</i>

<sup>1</sup> From Peterson and Chalif (1989), Schaldach (pers. comm.), Sada et al. (1987), Loetscher (1941, 1955), and Lowery and Dalquest (1951).

<sup>2</sup> Spanish names vary within the State. The names used here should be considered as a reference.

<sup>3</sup> Letters refer to population status: b = migratory and resident populations; m = migratory; r = rare winter visitor; u = uncertain numbers, unlettered species are residents.

ample, the rainforest in the San Martín and Santa Marta volcanoes, and the Uxpanapa region, are in urgent need of protection since their fragmentation is affecting forest dwelling raptors. A local committee should develop a network to alert northern colleagues about the situation of these areas, and other issues, including the bird trade, such a committee should inform local authorities and decisionmakers.

During spring migration more than 250 000 raptors have been recorded passing through Veracruz (Thiollay 1980, Tilly et al. 1990). Hawk Mountain Sanctuary Association, Hawk Watch International, and the Mexican group Ecosfera are currently studying migration in Veracruz. Funding for research, monitoring, and education remains a major problem, and today there are few opportunities to work as a biologist in Veracruz.

Ecotourism in Veracruz is an exciting prospect because of the multitude of bird species and the varied vegetative types. These attributes, together with more than 40 archaeological sites (Winfield 1991), make Veracruz a natural site for the development of this type of conservation effort.

#### ACKNOWLEDGMENTS

I thank Thomas Laura for sponsoring me as a member of RRF; Laurie Goodrich, Eduardo Iñigo, Ricardo Rodríguez, Frances Hamerstrom, and Keith Bildstein for their comments and suggestions on the manuscript; Sergio Agui-

lar and William Schaldach for their authorization to cite unpublished material; and Miriam Ramos for her help typing the manuscript.

#### LITERATURE CITED

- AGUILAR, R.S. In press a. Las aves de Los Tuxtlas. *In* Historia Natural de Los Tuxtlas. Editorial Universidad Veracruzana. Xalapa, Veracruz, Mexico.
- . In press b. El comercio de aves silvestres vivas en Xalapa. *La Ciencia y el Hombre*. Editorial Universidad Veracruzana. Xalapa, Veracruz, Mexico.
- AGUILAR-ORTIZ, F. 1970. Aves en peligro de extinción en México. INIREB, Cuadernos de Divulgación No. 6, Xalapa, Mexico.
- ALBERT, L., C. BARCENAS, A. MARTÍNEZ AND E. IÑIGO. 1989. Determinación de plaguicidas organoclorados en Aguila Elegante (*Spizaetus ornatus*) de la Sierra de Santa Marta, Veracruz. Joint Meeting of the Raptor Research Foundation and ICBP World Working Group of Birds of Prey. Veracruz, Mexico.
- ALCORN, J.B. 1983. El Te'lom Huasteco: Presente, Pasado y Futuro de un Sistema de Silvicultura Indígena. *Biótica* 8:315-325.
- COATES-ESTRADA, R. AND A. ESTRADA. 1985. Lista de las aves de la Estación de Biología de Los Tuxtlas Universidad Nacional Autónoma de México, D.F. Mexico.
- DE LA FUENTE, B. 1975. Las cabezas colosales olmecas. Testimonios del Fondo de Cultura Económica. México, D.F. México.
- DIRZO, R. 1987. Estación de Biología de Los Tuxtlas.

- Instituto de Biología Universidad Nacional Autónoma de México, Los Tuxtlas, Veracruz, Mexico.
- FLORES, V.O. AND P. GEREZ. 1988. Conservación en México: Síntesis sobre vertebrados terrestres, vegetación y uso del suelo. Instituto Nacional de Investigaciones sobre Recursos Bióticos (INIREB) y Conservación Internacional. Xalapa, Veracruz, Mexico.
- GÓMEZ, L.J. 1991. Densidad relativa de rapaces diurnas en una zona tropical perturbada. Tesis de Licenciatura. Facultad de Biología de Córdoba, Universidad Veracruzana. Córdoba, Veracruz, Mexico.
- GÓMEZ-POMPA, A. 1985. Los recursos bióticos de México (Reflexiones). Instituto Nacional de Investigaciones sobre Recursos Bióticos (INIREB) y Editorial Alhambra Mexicana. México, D.F. Mexico.
- GUNDER, F.A. 1982. La agricultura mexicana: transformación del modo de producción. Ediciones Era. México, D.F. Mexico.
- IÑIGO, E.E., M. RAMOS AND F. GONZÁLEZ. 1987. Two recent records of neotropical eagles in southern Veracruz, Mexico. *Condor* 89:671-672.
- LOETSCHER, F.W. 1941. Ornithology of the Mexican state of Veracruz with an annotated list of birds. Ph.D. thesis, Department of Zoology, Cornell University, Ithaca, NY.
- . 1955. North American migrants in the State of Veracruz, Mexico: a summary. *Auk* 72:14-52.
- LOWERY, G. AND W. DALQUEST. 1951. Birds from the state of Veracruz, Mexico. University of Kansas Publication, Museum of Natural History 3:531-649.
- MARCHAL, J.Y. 1984. Perfil diagramático de los principales pisos de vegetación. Page 89 in J.Y. Marchal and R. Palma. Análisis gráfico de un espacio regional: Veracruz. Instituto Nacional de Investigaciones sobre Recursos Bióticos (INIREB) e Institut Français de Recherche Scientifique pour le développement en coopération. Xalapa, Veracruz, Mexico.
- MEDELLÍN, Z.A. 1983. Obras maestras del museo de Xalapa. Studio Beatrice Trueblood. México, D.F. Mexico.
- PETERSON, R.T. AND E.L. CHALIF. 1989. Aves de México. World Wildlife Fund and Editorial Diana. México, D.F. Mexico.
- RAMOS, M. 1985. Endangered tropical birds in Mexico and northern Central America. Pages 305-318 in A.W. Diamond and T.E. Lovejoy (EDS.), Conservation of tropical forest. Technical Publication No. 4. ICBP.
- SADA, A.M., A.R. PHILLIPS AND M.A. RAMOS. 1987. Nombres en castellano para las aves mexicanas. Cuadernos de Divulgación. Instituto Nacional de investigaciones sobre Recursos Bióticos (INIREB). Xalapa, Veracruz, Mexico.
- SIEMENS, A.H. 1981. Indicios de aprovechamiento prehispánico de tierras inundables en el centro de Veracruz. *Biótica* 5:83-92.
- . 1982. Aprovechamiento agrícola precolombino en tierras inundables en el norte de Veracruz. *Biótica* 7:343-357.
- SOTO, M. AND E. GARCÍA. 1989. Atlas climático del estado de Veracruz. Instituto de Ecología A.C. Xalapa, Veracruz, Mexico.
- THIOLLAY, J.-M. 1980. Spring hawk migration in Eastern Mexico. *Raptor Research* 14(1):13-20.
- TILLY, F.C., S.W. HOFFMAN AND C.R. TILLY. 1990. Spring hawk migration in southern Mexico, 1989. *Hawk Migration Studies* 15(2):21-59.
- VEGA, J. 1988. Aves mexicanas posibles de calificarse como amenazadas o en peligro de extinción. International Council for Bird Protection—Mexico, Cuauhtli 1(1):3-4.
- WINFIELD, C.F. 1991. Las culturas del Golfo. Editorial Graphos. Xalapa, Veracruz, Mexico.

Received 19 November 1991; accepted 29 April 1992

Appendix 1. Addresses of conservation contacts in Veracruz, Mexico.

Gerardo García Gil and/or César Tejeda Cruz, ECO-SFERA (XALAPA), Apartado Postal 424, Xalapa, Veracruz 91000, Mexico.

Sergio Aguilar Rodríguez, Parque de la Flora y Fauna Silvestre Tropical, Universidad Veracruzana, Apartado Postal 57, Catemaco, Veracruz 95870, Mexico.

Fernando González García, Instituto de Ecología A.C., Ecología y Comportamiento Animal, Apartado Postal 63, Xalapa, Veracruz 91000, Mexico.

Rosamond Coates-Estrada, Estación de Biología Tropical Los Tuxtlas, Universidad Nacional Autónoma de México, Apartado Postal 176, San Andrés Tuxtla, Veracruz, Mexico.

Fernando Vela López, Instituto Veracruzano de Cultura, Canal esquina Zaragoza S/N, Veracruz, Veracruz 91700, Mexico.